1NC vs. Nanotech

T – Development

A. Incentives violate several terms

1. Not increase – increase requires an actual increase, but incentives depend on effects

HEFC 4 (Higher Education Funding Council for England, "Joint Committee on the Draft Charities Bill Written Evidence", June, http://www.publications.parliament.uk/pa/jt200304/jtselect/jtchar/167/167we98.htm)

9.1 The Draft Bill creates an obligation on the principal regulator to do all that it "reasonably can to meet the compliance objective in relation to the charity".[45] The Draft Bill defines the compliance objective as "to increase compliance by the charity trustees with their legal obligations in exercising control and management of the administration of the charity".[46] 9.2 Although the word "increase" is used in relation to the functions of a number of statutory bodies,[47] such examples demonstrate that "increase" is used in relation to considerations to be taken into account in the exercise of a function, rather than an objective in itself. 9.3 HEFCE is concerned that an obligation on principal regulators to "increase" compliance per se is unworkable, in so far as it does not adequately define the limits or nature of the statutory duty. Indeed, the obligation could be considered to be ever-increasing.

2. Not its -- Its means the increase must be done by the USFG, but under the plan others take the action to increase

Words and Phrases '6 vol 22B p 524

C.C.A.5 (Tex.) 1935. Where corporation transferred all its assets, including large profits, to newly organized corporation in exchange for capital stock, and transfer was treated as reorganization under which no gain or loss was to be recognized, profits in hands of newly organized corporation held taxable as "its earnings or profits," within revenue act providing that term "dividend" means any distribution made by corporation to its shareholders whether in money or other property out of "its earnings or profits" accumulated after February 28, 1913; word "its" being possessive pronoun indicating that earnings and profits belong to corporation. Revenue Act 1926, § 201(a), 26 U.S.C.A. (I.R.C.1939) § 115.—Murchison's Estate v. C.I.R., 76 F.2d 641.—Int Rev 3747.

B. The affirmative interpretation is bad for debate

Limits are necessary for negative preparation and clash. They unlimit by depending on effects. Everything affects the ocean development / exploration

Timmons 12 Bob Timmons, Artist - Author – Speaker, the Artist for the Ocean October 21, 2012 Ocean Guardians http://oceanguardians.com.au/artist-for-the-ocean-bob-timmons/

Everything is connected and **everything affects the ocean in the end since its majority of the planet's surface and subsurface.**

They also unlimit by multiplying the topic by the huge number of private entities and by the different kinds of incentives.

Moran, 86 (Theodore, Investing in Development: New Roles for Private Capital?, p. 28)

Guisinger finds that if "**incentives"**are broadly defined to include tariffs and trade controls along with tax holidays, subsidized loans, cash grants, and other fiscal measures, they **comprise more than forty separate kinds of measures.** Moreover, the author emphasizes, **the value of an incentive package is just one of several means that governments use to lure foreign investors.** Other methods—for example, promotional activities (advertising, representative offices) and subsidized government services—also influence investors' location decisions. The author points out that empirical research so far has been unable to distinguish the relative importance of fundamental economic factors and of government policies in decisions concerning the location of foreign investment—let alone to determine the effectiveness of individual government instrucments.

C. T is a voter because it's necessary for good, well-prepared debating

Adv. CP – Marine BioD

1. Text: The United States federal government should institute and fund a Quadrennial Ecosystems Services Trends Assessment.

2. Solves biodiversity

PCAST 11

(President's Council of Advisors on Science and Technology, "REPORT TO THE PRESIDENT SUSTAINING ENVIRONMENTAL CAPITAL: PROTECTING SOC IETY AND THE ECONOMY," White House, July 2011, http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_sustaining_environmental_capital_report.pdf)

In the report we transmit here, **PCAST's Working Group on Biodiversity Preservation and Ecosystem Sustainability addressed the needs and opportunities in relation to both of these dimensions of the capacity of governments—and especially the U.S. Federal government—to fulfill more effectively their responsibility in relation to the protection of environmental capital and ecosystem services.** The Working Group's recommendations, which we endorse, involve a three-pronged effort encompassing ways to make better use of existing knowledge, to support the generation of essential new knowledge, and to expand the use of informatics. **We here boil down those recommendations to the following six key points. 1. The U.S. government should institute and fund a Quadrennial Ecosystems Services Trends (QuEST) Assessment. QuEST should provide an integrated, comprehensive assessment of the condition of U.S. ecosystems; predictions concerning trends in ecosystem change; syntheses of research findings on how ecosystem structure and condition are linked to the ecosystem functions that contribute to societally important ecosystem services; and characterization of challenges to the sustainability of benefit flows from ecosystems, together with ways to make policy responses to these challenges more effective.** The **QuEST assessment should draw and build upon the wide variety of ongoing monitoring programs, previously conducted and ongo- ing assessments of narrower scope, and the expanded monitoring and species-discovery efforts for which we also call in this Report**. And, it should be closely coordinated with the quadrennial National Climate Assessment mandated by the Global Change Research Act of 1990.

Politics

Nanotech is controversial – empirics

Piper 13

(Arthur Piper, April 9 2013, Journalist, "The Big Risk of Small Particles: The Threats and Promise of Nanotechnology," http://www.rmmagazine.com/2013/04/09/the-big-risk-of-small-particles-the-threats-and-promise-of-nanotechnology/ VM)

"Until risk assessment for nanomaterials is validated and fit-for-purpose detection methods are developed, we do not support the commercial sale of nano-sunscreens," said Georgia Miller, the author of the report.¶ **There have been similar arguments about nanotechnology in other fields. Five years ago, it was nanosilver**. In 2008, an alliance of health and environmental campaigners filed a petition with the U.S. Environmental Protection Agency (EPA) against manufacturers of nanosilver products. It argued that the substance, which is used in washing machines, among other things, could increase the toxicity of waterways.¶ **Before that, it was carbon nanotubes, which are used in medical equipment, building materials, sporting goods and vehicles but may also have the potential to cause cancer. And in 2003, the U.S. Congress became embroiled in a bitter fight about the definition, uses and risks associated with such technologies. Everywhere it is found, this tiny technology seems to cause trouble.**

Environment Security Critic

The framing of apocalyptic climate change ensures bureaucratic, short-term interventionism—discourse shapes policymaking

Detraz 11

(Nicole Dentraz, Assistant Prof of Political Science @ the Univ. of Memphis, "Threats or Vulnerabilities? Assessing the Link between Climate Change and Security," Global Environmental Politics Vol. 11.3, August 2011, pg. 104-120)//mm

Discourse is a powerful concept animating much academic research and a **powerful force within policy debates.** Hajer de fines discourse as the "**specific ensembles of ideas, concepts and categorization that are produced, reproduced and transformed in a particular set of practices and through which meaning is given to physical and social realities**."9 This definition suggests that discourses are constantly-evolving entities that are shaped by society over time. Simultaneously, **discourses are entities that actors** can **draw on strategically in order to gain attention for a particular issue, or frame an issue in a specific way.** The process of discourse analysis involves tracking the storylines that make up a larger dis- course. A storyline is a set of concepts, ideas, or themes that are repeated and combine to form a discourse.10 In this section, I outline two distinct discourses (environmental conflict and environmental security11), which focus on particular framings of the relationship between security and the environment. In line with arguments that **discourses can guide debate and policy-making in distinct ways**, **each of these distinct discursive frames are likely to yield unique policy recommendations.** For example, **Stern de fines discourse as "the production and representation of meaning, which delimit the realm of understanding, action, and imagination within a certain framework**."12 The environmental conflict discourse links the environment and environ- mental problems to traditional security concerns, including a general concern for state security. **Most authors who use an environmental conflict discourse focus on the possibility that groups within society will engage in violent conflict over natural resources.** These conflicts can be the product of scarcity13, abundance14, or dependence15 on natural resources and are typically understood to threaten the stability of the state. **The primary challenge is to identify those most immediately at risk of conflict and design policy interventions to avoid conflict and ensure state stability. This is largely understood to be the responsibility of state institutions**. **Due to the sense of urgency embedded in this dis- course, policies are** likely to **be aimed at short-term adaptation strategies as a means of avoiding violent conflict. The environmental security discourse is concerned with the negative impacts of environmental degradation for human beings**. While environmental conflict is largely state-centric and can still directly be linked to military security, **environmental security is much more closely linked to notions of security at an individual level, or human security**.16 It is important to note, however, that the concerns embedded in environmental security are more specific than the general concept of human security, which can refer to anything that negatively impacts the safety and survival of humans. **In this discourse, the threat is located in negative consequences of environmental damage and those who are vulnerable are all human beings.**17 This concept of human vulnerability is widely used in general discussions of global environmental change, and climate change in par- ticular.18 According to Gaillard, much of the literature on vulnerability focuses on "the susceptibility to

suffer damage in a potentially dangerous event, either natural, economic or political."19 **In the context of these debates, vulnerability stresses the condition of humans being susceptible to individual and collective harm because of environmental change**. In general, environmental security is broader than environmental conflict because of the former's interest in issues concerning all of humanity and the latter's more focused concern with those susceptible to resource conflict. That being said, environmental security does include a concern about the potential for conflict over resources—however, this is not the only concern. **The de fining characteristic of the environmental security discourse is that all authors who use it address the negative impact of environmental degradation for human beings**. This environmental degradation can come from natural processes or from human behaviors, but there is some negative aspect of the change for humans. **Policymaking based on an environmental security discourse will be directed at vulnerable populations, and may require a range of governance mechanisms at different scales, ranging from the local to the global, and involving both state and nonstate actors**. While there is overlap between these discourses, **each focuses on particular elements of security and its relationship to the environment**. In other words, each discourse has its own set of storylines for discussing security and environ- ment connections. These storylines determine how broadly or narrowly key ideas and terms are conceptualized. Additionally, **each produces distinct under- standings of the security implications of environmental degradation, and yields unique policy recommendations**. The Climate Change and Security Debate **In the past few years there has been a flurry of** books, journal **articles, policy documents and** media **reports linking climate change to security issues. Some understand this trend as a way to grant additional attention and resources to cli- mate change**, **and to get the public to take it seriously**. Campbell and Parthemore claim that the reason for linking nontraditional issues to security "is to reorient leaders and the established bureaucracy toward seeking and considering a broader array of solutions."20 Additionally Liotta and Shearer claim that "to better understand impacts of climate change on human needs, we focus them throughtheconceptuallensofsecurity."21 Both of these statements illustrate the strategic usage of security discourses to raise awareness of environmental issues, and climate change in particular. It seems logical that the very reasons that people started linking environ- mental issues to security discourses, namely to gain attention to their issues from both scholars and policymakers, is the same reason that people get on the climate change bandwagon. In terms of making connections between environment and security, Raleigh and Urdal argue that **there was "an interest among Western national security establishments to identify potential threats that could legitimize their continued existence" in a post-Cold War world**.22 **Actors create, maintain, and use linkages to exercise influence in a particular realm.**23 There is significant evidence that actors have linked a variety of issues to security dis- courses in order to draw attention to them. For example, several scholars have linked health issues like HIV/AIDS to security discourses to "raise international awareness and generate more resources to combat the disease."24 This is a similar tactic that is used by those who wish to raise the salience of environmental issues. While for some this takes the form of strategically linking issues like land use25 and biodiversity26 to the climate regime, for others it takes the form of linking the climate regime to security discourses.

1NC Ocean BioD

1. No brink – Hundreds of species have gone extinct by now and they have not → to extinction.

2. Nanotech production –> pollution which hurts the environment

Alvarez 6

(Pedro J. Alvarez, JOURNAL OF ENVIRONMENTAL ENGINEERING © ASCE / OCTOBER 2006, Dept. of Civil and Environmental Engineering, Rice Univ., "Nanotechnology in the Environment—The Good, the Bad, and the Ugly," http://ascelibrary.org/doi/pdf/10.1061/%28ASCE%290733-9372%282006%29132%3A10%281233%29 VM)

On the bad side, **the environment will be** increasingly prone to **suffer pollution from nanomaterials in** consumer **products** such as sunscreens, detergents, and cosmetics, as well **from** accidental **releases during production, transportation, and disposal operations.** Thus, engineered **nanomaterials could become a new** class of **pollutants**, and questions about their transport, fate, reactivity, bioavailability, and toxicity will become increasingly important. **The small size of** such **materials implies greater risk of uptake** (e.g., by breathing) **and interacting with** sensitive organs or **ecosystem components. Some** nanomaterials **have** already **been reported to be toxic to humans, fish, and bacteria. This raises concerns** not only **about** public health (e.g., related to occupational exposure) but also about broader **environmental impacts** (e.g., bioaccumulation in food webs and disruption of bacterial activities that are important to the health of all known ecosystems and biogeochemical cycles). Many **examples in** modern **history illustrate the** unintended **consequences of initially promising tech**nologies, **including the** blind **release of** "beneficial" **chemicals**, such as chlorofluorocarbons, DDT, and MtBE **into the environment. These examples forewarn us of** potential **environmental impacts of** some **nanomaterials**, which deserve more attention and research. However, on the ugly side, **the manufacture, use, and disposal of** engineered **nanomaterials are not regulated**, mainly **due to a lack of ecotoxicological infor**mation **and the novelty of the field.** Thus, there is an urgent need to create and disseminate information about the environmental implications of nanotechnology so that its growth does not continue to outpace the development of appropriate regulations to mitigate potential risks. Furthermore, the large intellectual and financial **investments in nanotechnology demand that it be publicly accepted and sustainable. The backlash against genetically modified crops resulted in a huge setback for ag**riculture. **A** similar **backlash against nanotechnology would result in the delay of** beneficial **nanomaterials coming to market.** In conclusion, it is important to capitalize on the leapfrogging opportunities offered by nanotechnology to improve and protect environmental quality. Yet, responsible **uses of nanomaterials in** commercial **products and environmental applications**, as well as prudent management of the associated risks, **require a better understanding of their mobility, bioavailability, and impacts to a wide variety of organisms.**

3. Nanotech destroys bioD, → extinction – kills plants vegetation and creates airborne particles

Arabe 4

(Katrina C. Arabe, March 16 2004, author, "The Risks & Rewards of Nanotechnology," http://news.thomasnet.com/IMT/2004/03/16/the_risks_rewar/ VM)

Also disturbing is **the possible health effects of** engineered **nanoparticles. "The smaller the particles, the more toxic they become,**" says Vyvyan Howard, a University of Liverpool pathologist who analyzes environmental aerosols. Already, the first two studies examining **nanoparticles' impact** on **health** have not yielded reassuring results, **reporting** a different and more **serious lung damage** than **that caused by conventional toxic dusts.** In the first study, which was sponsored by NASA, three kinds of carbon nanotubes —microscopic carbon cylinders—were found to cause lung abnormalities in mice after these particles were washed into the animals' lungs. **And** the lesions **worsened over time, with** some **resulting in tissue death.** In the second study, **rats were given** similar **exposures, and** in a startling result, 15% of the animals receiving the biggest amount **died from lung blockages within 24 hours**—something the researchers had never before observed for any lung toxin. **And the damage may not stop at the lungs.** University of Rochester toxicologist Gunter Oberdoerster has illustrated through experiments **that inhaled nanoparticles can spread to a rat's brain.** Some are also concerned about nanoparticles accumulating in animal organs. Researchers at Rice University's CBEN have demonstrated that **particles** at the nanoscale—like many other non-biodegradable **pollutants—build up in living things over time. They accumulate in microbes, in the worms that feed on those microbes and in animals higher up the food chain.** CBEN researchers stress that this doesn't mean that nanoparticles pose a safety threat. Some **scientists**, however, **believe** that **particles at** the **nanoscale could burn up soil microbes, disturbing soil chemistry and its ability to sustain plant life. Others are** even **convinced that nanotechnology could bring about the end of the world.** They believe a well-known article written in 2000 by Bill Joy, co-founder of the computer giant Sun Microsystems, who theorized that self-replicating nanomachines could amass beyond our control and destroy the living world. Not all scientists dismiss this scenario.

3.Nanotech – empirics prove

Hannah and Thompson 8

(William Hannah and Paul B. Thompson, February 14 2008, Michigan State University, "Nanotechnology, risk and the environment: a review," http://pubs.rsc.org/EN/content/articlehtml/2008/em/b718127m VM)

Ecohazards

There exist very few **studies of the hazards of nanotechnology to non-humans and the environment.** Those that have been completed are referenced and exploited thoroughly in the risk literature. The following represent the better part of these studies. **Ecotoxicological studies** by E. Oberdorster25 and Lovern and Klapper34 **show** that **there is a lethal concentration of colloidal fullerenes that are uncoated and water soluble in Daphnia magna. In** largemouth **bass**, E. Oberdorster found that **water solubized, uncoated, pure fullerenes induced** oxidative **stress in the brain of** juvenile Largemouth **Bass**.35 The results of this study showed targeted effects on brain tissue. Transport of nanoparticles to the brain is independently observed in other articles as well. Oberdorster cites Tjalve et al.,36 who observed the transport of nanoparticles through olfactory cells to the olfactory bulb in pike. **Oberdorster also observed GSH** (Glutathione) **reduction in the gills. A reduction in GSH is an indication of an overtaxed antioxidant defense system.**35 The **effects found** by Oberdorster **are found in** different **species of fish and different nanoparticles are observed being taken up. Further studies show damaging effects of nanoparticles on fathead minnows and Japanese medaka.**37,38 Oberdorster also found that the fullerenes used in her trials clarified the water. This suggests that the fullerenes are bactericidal.35 This finding is supported by Kai et al.39 There are other

authors who found similar microbial effects. Escherichia coli have been shown to be affected by some nanoparticles including fullerenes and silver nanoparticles.40 **Nanoparticles** may **affect soils as well**. There is direct evidence that certain soil-bound aluminium **nanoparticles could inhibit root growth in plants**.41,42 There are few studies that measure directly the effects of engineered nanoparticles on non-humans, plants, and the environment. Again, the current **research indicates that at** certain **doses nanoparticles are toxic to organisms** other than humans. The **hazards include morbidity and mortality through** uptake and transport of the **nanoparticles to various tissues in the body.**

5. Coral Reefs are resilient and will adapt

Gosselin 11

(P Gosselin, July 28 2011, an Associate Degree in Civil Engineering at Vermont Technical College and a Bachelor of Science in Mechanical Engineering at the University of Arizona in Tucson, "Threat To Coral Reefs Exaggerated, Says New Study," http://notrickszone.com/2011/07/28/threat-to-coral-reefs-exaggerated-says-new-study/ VM) Some **scientists and media have gotten much attention claiming that the world's coral reefs could disappear in as little as 20 to 30 years** – all **because of humans consuming fossil fuels** and whatever.¶ Now the Financial Times Germany reports on **a study** that **claims this is all exaggerated.¶ The world's largest coral reef off the** east **coast of Australia is not going to disappear as fast as once previously thought**, according to a new study. **Warnings that the Great Barrier Reef could die off due to climate change** over the next 20 to 30 years **are exaggerated** says Sean Connolly of the James Cook University."¶ This comes to no surprise for skeptics. **How many millions of years and through what ranges of temperature swings have the coral reefs survived so far? Indeed a few tenths of a degree Celsius of change over decades will have no impact on the reefs. And** I seriously **doubt the reefs are going to do what the models tell them.**¶ The James Cook University Press release here says:¶ …some **current projections of** global-scale **collapse** of reefs within the next few decades **probably overestimate the rapidity and uniformity of the decline.**"¶¶ Again, **if the** relatively **sudden transition from ice age to optimum did not kill them, why would a few tenths of a degree** over decades or centuries **do it?¶** Wikipedia writes that coral reefs in the Persian Gulf have adapted to temperatures of 13 °C (55 °F) in winter and 38 °C (100 °F) in summer, i.e. 25°C change in 6 months. Like any species on the planet, reefs are always threatened by something. The press release writes:¶ However **reefs are naturally highly diverse and resilient, and are likely to respond to the changed conditions in different ways and at varying rates.**"¶ The James Cook press release, despite its obvious findings, still tries to convey an aura of alarm (for funding) yet admits that **climate change is a natural process that has occurred time and again in the past.**¶ Past extinction crises in coral reef ecosystems appear to coincide with episodes of rapid global warming and ocean acidification, they say. This has led some to predict rapid, dramatic, global-scale losses of coral reefs."¶ **The rapid changes they mention here were measured in degrees per decade and century, and not tenths of a degree as is the case with today's relatively boring rate of change.¶**

6. No Solvency – alt causes

Amos 10

(Amy Mathews Amos, 7/16/2010, "Killing Nemo and his Coral Home," http://www.theepochtimes.com/n2/content/view/30778/)

But **it's not just fish populations that get destroyed. Coral reefs are structures produced by living organisms in oceans. The primary organisms typically are stony corals that secrete an**

exoskeleton of calcium carbonate, creating a reef that supports the corals and a huge variety of other animal and plant life. Divers often squirt cyanide into reefs to stun fish, making them easier to catch. Cyanide typically doesn't kill the fish outright, but it does kill corals and other life on the reef. Divers also often pry corals apart to find fish hiding in crevices, destroying a reef structure that took decades or centuries to build. All of this comes at a time when corals can least afford it. Pollution and overfishing for food are major problems on these reefs. And corals are notoriously vulnerable to increases in water temperature and other effects of climate change. According to Tissot, the net effect of removing reef fish in such large numbers is that we are making coral reefs less able to handle stresses like global climate change. "Our best defense against climate change is a stable reef with an intact ecosystem. A reef that retains its own natural complexity will be more resilient to these changes." The good news and the bad is that this **destruction is driven largely by demand in the United States and Europe.** Because we created most of the demand, we can also change it. According to Dr. Eric Borneman, a coral biologist at the University of Houston and an author on the aquarium hobby, "Just reducing the mortality rate would make a huge, huge difference." He urges hobbyists to buy fish only from reputable businesses that source from responsible exporters that can trace their fish to its source. These businesses sell healthy fish that clearly have been handled well throughout their journey. Although they may be more expensive initially, the higher survival rates of these fish make them less costly because they don't need to be replaced—and therefore don't fuel demand for overfishing on coral reefs. He also urges hobbyists to learn "which fish are almost impossible to kill and which are almost impossible to keep alive" in captivity. Those that won't survive in a tank should never be removed from a reef. Brian Plankis, president of the nonprofit Reef Stewardship Foundation, maintains, "Everyone can take action to help coral reefs, not just hobbyists." He recommends reducing your personal carbon footprint by driving a more fuel-efficient vehicle, taking public transportation, and purchasing electricity from renewable sources. Ultimately, **changes need to happen on the water in source countries to eliminate overfishing and cyanide use. But changing demand in the United States can help**: without a market, there's nothing to sell. **Changes to U.S. import laws are needed** to prevent unregulated or poorly managed fish from entering the country. **Stricter shipping requirements to reduce the number of fish that die en route may also be necessary.** In the meantime, keep rooting for Nemo. The future of the world's coral reefs may depend on it.

7. Oceans are resilient ads is so vast that localized extinction doesn't natter it so big that loss in one location does = extinction

ITOPF 10

(International Tanker Owners Federation Ltd., February 2010, "Recovery," http://www.itopf.com/marine-spills/effects/recovery/

Marine organisms have varying degrees of **natural resilience to changes in their habitats.** The **natural adaptations of populations** of animals and plants **to cope with environmental stress, combined with their breeding strategies, provide** important **mechanisms for coping with** the daily and seasonal **fluctuations in their habitats and for recovering from predation and other stochastic events.** Some natural phenomena can be highly destructive. The short-term power of hurricanes and tsunamis can easily be appreciated, as can the damage they cause. The cyclical El Niño phenomenon has major long-term consequences for marine organisms, seabirds and marine mammals throughout the entire Pacific Ocean. **Organisms suffer under** such **onslaughts, but after what is often severe disruption and widespread mortality, the marine populations re-establish themselves over a period of time** and **this process constitutes natural recovery. An important reproductive strategy for many marine organisms is the production of vast numbers of eggs and larvae which are released into the plankton and are widely distributed by currents. This mechanism has evolved to take maximum advantage of available space and resources in marine habitats and to deal with e.g. predation.** In some cases, only one or two individuals in a million actually survive through to adulthood. A less common reproductive strategy that is generally restricted to long-lived species that do not reach sexual maturity for many years is to produce relatively few, well-developed, offspring. These species are better adapted to stable habitats and environments and as a result, their populations are likely to take much longer to recover from the pressures of localised mortality e.g. the effects of an oil spill. Whilst there may be considerable debate over what constitutes recovery, **there is a widespread**

acceptance that natural variability in systems makes getting back to the exact pre-spill condition unlikely, and most current definitions of recovery focus on the re-establishment of a community of plants and animals which are characteristic of the habitat and are functioning normally in terms of biodiversity and productivity.

8. Research won't produce new nanotech applications

Sargent 8

(John F. Sargent, Specialist in Science and Technology Policy Resources, Science, and Industry Division, May 15 2008, "CRS Report for Congress: Nanotechnology and U.S. Competitiveness: Issues and Options," http://fas.org/sgp/crs/misc/RL34493.pdf VM)

Specialist in Science and Technology Policy Resources, Science, and Industry Division

Basic **research in nanotechnology may not translate into viable commercial applications.** Though no formal assessment of the composition of the NNI budget has been made, there is general consensus that the NNI investment since its inception has been focused on basic research. The National Science Foundation defines the objective of basic research as seeking "to gain more comprehensive knowledge or understanding of the subject under study without applications in mind." Therefore, **while basic research may underpin applied research, development, and commercialization, that is not its primary focus or intent. In general, basic research can take decades21 to result in commercial applications, and many advances in scientific understanding may not present commercial opportunities**

9. Nanotech fails – not energy efficient and bad for the environment

FOE 10

(Friends of the Earth Europe, November 10 2010, "Nanotechnology: true climate and energy cost exposed," http://www.foeeurope.org/www.foeeurope.org/press/2010/Nov16_nanotechnology_true_climate_energy_costs.html VM)

Brussels/Washington, D.C – **Nanotechnology will not** significantly **increase energy efficiency, or** help **tackle climate change** in its current form, reveals a new report from Friends of the Earth in Europe, US and Australia, released today [1]. **Nanotechnology**, climate and energy: **over-heated promises and hot air exposes** the true **environmental and energy costs of nanotechnology, promoted as 'green' by the nanotech-industry.**¶ The report details the complexity of **nanotechnology** and demonstrates that **current uses fail to deliver benefits for global warming, resource depletion and pollution, but instead increase energy use and create environmental risks.**¶ Magda Stoczkiewicz, director of Friends of the Earth Europe said: "**Nanotechnology has** the theoretical **potential to change the way we harness, use and store energy. However**, in reality **nanotechnology** products **require large amounts of energy to manufacture, at the environment's expense, and do not deliver the levels of savings promised."**¶ **Nanotechnology** has been the focus of considerable 'greenwash' and industry has promoted **it** as is a solution to our environmental concerns. But, it **is drawing** valuable **investment away from proven solutions to the environmental crisis, such as renewable technologies. Current uses**, including socks, sports equipment and cosmetics, offer no energy- or environment-saving benefits, but **require vast amounts of energy.** The embodied energy in a single kilogram of carbon nanotubes, used in sporting equipment and other nanoproducts, may be as great as 167 barrels of oil.¶ Ian Illuminato, Friends of the Earth US and co-author of the report, said: "Despite industry claims, **nanotechnology will not** significantly **contribute to energy saving and greenhouse gas reduction. In practice it will do the opposite**: giving politicians an excuse to continue with 'business as usual', at the expense of smart, informed

technology choices and behavioural change."¶ "**Nanotechnology is no quick** techno-**fix** for our **environmental problems. At best it can make a small** positive **contribution to energy and climate problems, but it has the potential to make things much worse.**"¶ Georgia Miller, Friends of the Earth Australia and co-author of the report, said: "It is important the public understands that many nanotechnology applications come at a high environmental cost. At a time when we need to reduce our reliance on fossil fuels, there is growing investment in nanotechnology to find and extract more oil and gas, instead of investment in proven solutions such as renewable technologies."

1NC Global Pandemic

1. Disease Inevitable – Multiple global hotspots and always a risk of mutations – The AFF doesn't solve worldwide.

2. Nanotech is not only bad for the environment but also for humans – air born particles causes cancer

Holland 4

(Åsgeir Helland, Thesis for the fulfilment of the Master of Science in Environmental Management and Policy Lund, Sweden, October 2004, "Nanoparticles: A Closer Look at the Risks to Human Health and the Environment; Perceptions and Precautionary Measures of Industry and Regulatory Bodies in Europe," http://www.nano.org.uk/members/MembersReports/Asgeir_Helland_Nanoparticles.pdf VM)
The literature **review indicates that there** might be a **correlation between a decrease in particle size and an increase in toxicity. This** probably **has something to do with** the increased surface area and/or with the **increasing** number of **particles.** It is known from **studies that an increase in** ambient **particle concentration is related to an increase in mortality and diseases in the** exposed **population.** Therefore are free **nanoparticles that can become airborne perceived as the most potentially hazardous** type of nanoparticles. Another consideration is **chemical composition of the nanoparticles** as studies show **that different materials give** dramatically different **inflammatory responses in the lung.** The surface coating of the material is also believed to have influence on the toxicity of the particle. To make nanoparticles biodegradable will therefore prevent many problems. As a general rule, the smaller the particles are, the more of them are absorbed and the deeper into the body they can penetrate (Hett, 2004). **Nanoparticles once entered the body** may **travel freely in the blood and through the body and reach organs like the liver or the brain.** There are nanoparticles in cosmetics, suntan lotion and baby products that regulate and improve the moisture, odour or colour, but up till today, there is no clear evidence whether nanoparticles can be absorbed through the skin The novel properties are exactly what is making novel nanoparticles of such interest for the industry and society. However **the properties which make the nanoparticles** interesting are also believed to **change the toxicity of the material. If** the roots of **plants were to absorb nanoparticles, the nanoparticles could enter the food- chains. Nanoparticles with colloidal characteristics may be ideal to carry toxic material, such as water-repelling pollutants and heavy metals. As nanoparticles** tend to be **more reactive**, due to the size, **they** may **react with other substances in the environment and lead to new** and possible **toxic compounds. In the long run it is a possibility for a wide exposure of the** entire **ecosystem to** engineered **nanomaterials through** the **water and soil.** One observation is that only a limited amount of the published work is based on industrial research. It is more likely to believe that also the industry is doing research than that they don't know or do anything. The industry hence has a marginal contribution to the 'public' knowledge base

3. Nanoparticles causes lung cancer, heart disease, asthma, and causes cellular damage

Rudd 9

(Jeffrey Rudd, Apr 13, 2009, Columbia Journal of Environmental Law, "Regulating the Impacts of Engineered Nanoparticles under TSCA: Shifting Authority from Industry to Government," http://www.columbiaenvironmentallaw.org/assets/pdfs/33.2/Rudd.33.2.pdf VM)
In addition to causing adverse **environmental impacts, nanoparticles** may **affect human health. Nanoparticles move easily across cell membranes to** the brain or other **organs following inhalation.** n28 The Royal Society of Engineering has warned manufacturers that **nanoparticles are hazardous to humans and should not be released into the environment**. n29 Clinical and experimental **studies indicate that nanoparticles' small size, large surface area, and ability to generate reactive oxygen species may cause the particles to induce lung injury. Exposure to** small, toxic, airborne **particles may cause lung cancer, heart disease, asthma, increased mortality, and cellular damage**

4. Infectious diseases does not cause extinction – population density → resistance

Parry 11

(Wynne Parry, February 2 2011, Live Science Staff Writer, "Theory About Mammals and Fungus Explains Bat Plague," http://www.livescience.com/11705-theory-mammals-fungus-explains-bat-plague.html VM)
Even highly virulent infectious disease does not cause extinctions – because as population density decreases, so does transmission, and the remaining individuals are more resistant. In addition, at the end of the Cretaceous, dinosaurs weren't the only ones to be decimated. Marine animals were affected, as were many species of flowering plant, according to Douglas Robertson, of the Cooperative Institute for Research in Environmental Sciences at the University of Colorado.¶ "**It is not even vaguely plausible that all these extinctions**, let alone just the various dinosaur species extinctions, **were all caused by some pathogen**," Robertson wrote in an e-mail.

2NC vs. Nanotech.

2NC Global Pandemic

Nanotech → disease mutations

ETC Group 2

(ETC group, formerly RAFI - the Rural Advancement Foundation International, May/June 2002, Issue # 76, "No Small Matter! Nanotech Particles Penetrate Living Cells and Accumulate in Animal Organs," http://online.sfsu.edu/rone/Nanotech/nosmallmatter.html VM)

Again, what's the big deal? The big deal is uncertainty, but scientists see two potential problems specific to these forms of carbon–one problem has to do with their shape and one, apparently, has to do with their size. It turns out that Dr. Wiesner's **comparison of** carbon nanotubes with asbestos is not merely rhetorical, highlighting the need to assess the dangers of a material before it becomes ubiquitous. Carbon **nanotubes resemble asbestos fibers in shape: they are long and needle-like.** According to Dr. Wiesner, carbon nanotubes cannot pose much of a threat at present because, in our environment, they tend to clump together rather than exist as single fibers (which have the potential to cause serious respiratory problems as asbestos fibers have). However, an **intensive** area of **research is to figure out a way to solubilize nanotubes–in effect, to de-clumpthem–so that they can be more easily used as single, detached fibers**.. Two **patents on methods of** solubilizing **nanotubes in organic solutions have issued in the last year** to the University of Kentucky (USA).24. Very few **studies have been done to learn what might happen if nanotube fibers were breathed in** or if they were used in drug delivery or disease diagnoses or as biosensors. **Immunologist** Silvana Fiorito has **discovered in** preliminary **research that when a** 1 micrometer-wide particle of pure carbon (in the form of graphite) is introduced into a cell, the cell responds by producing nitric oxide, which indicates that the immune system is working and the body is fighting back against an invading foreign substance.. When a **nano-sized particle** of the same substance — pure carbon — **is added to cells** (in the form of either nanotubes or fullerenes), **the cells fail to produce an immune response–they welcome the alien carbon like a long lost relative. The ability to slip past the immune system may be desirable for drug delivery, but what happens when uninvited nanoparticles come calling**? In other words, once **nanotechnologists have figured out how to distract the bouncer guarding the door, how can you be sure you're still keeping out the riff-raff?**

2NC Ocan BioD

Nanotech is bad for the environment – its highly toxic

Hu and Choi 8

(April 30 2008, the silver nanoparticle research conducted by Hu and his graduate student, Okkyoung Choi, was recently published in Water Research and Environmental Science & Technology. The study was funded by a grant from the National Science Foundation, "Silver Nanoparticles May Be Killing Beneficial Bacteria In Wastewater Treatment," http://www.sciencedaily.com/releases/2008/04/080429135502.htm VM)

Several **products containing** silver **nanoparticles already are on the market, including socks containing** silver **nanoparticles designed to inhibit odor-causing bacteria and high-tech, energy-efficient washing machines that disinfect clothes by generating the** tiny **particles. The positive effects** of that technology **may be overshadowed by the** potential **negative environmental impact. "Because of** the **increas**ing use **of** silver **nanoparticles in** consumer **products, the risk that** this **material will be released into sewage lines, wastewater treatment** facilities, **and**, eventually, **to rivers, streams and lakes is of concern**," said Zhiqiang Hu, assistant professor of civil and environmental engineering in MU's College of Engineering. "We found that silver **nanoparticles are extremely toxic. The nanoparticles destroy** the benign **species of bacteria that are used for wastewater treatment. It** basically **halts** the **reproduction activity of** the good **bacteria."** Hu said silver **nanoparticles generate** more unique **chemicals, known as highly reactive oxygen species, than do larger forms of silver. These oxygen species chemicals** likely **inhibit bacterial growth.** For example, **the use of wastewater treatment "sludge" as** land-application **fertilizer** is a common **practice**, according to Hu. **If** high levels of silver nanop**articles are present in the sludge, soil used to grow food crops may be harmed.** Hu is launching a second study to determine the levels at which the presence of silver nanoparticles become toxic. He will determine how silver nanoparticles affect wastewater treatment processes by introducing nanomaterial into wastewater and sludge. He will then measure microbial growth to determine the nanosilver levels that harm wastewater treatment and sludge digestion. The Water Environment Research Foundation recently awarded Hu $150,000 to determine when silver nanoparticles start to impair wastewater treatment. Hu said nanoparticles in wastewater can be better managed and regulated. Work on the follow-up research should be completed by 2010.

Nanotech kills crucial river bacteria, which is the base of the food chain

Davidson 5

(Keay Davidson, San Francisco Chronicle Science Writer, October 20 2005, "Scientists Warn Nanotechnology May Present Serious Health Hazards," http://www.organicconsumers.org/ge/nano102105.cfm VM)

The U.S. government **should spend** more **money investigating** potential health and **environmental hazards of nanotechnology**, a leading environmental group says. New types of materials and chemicals that are invisibly small -- i.e., with diameters measured in nanometers, or billionths of a meter -- have many possible valuable uses in medicine, environmental cleanups, water treatment, energy production, technology and other areas, representatives of the Washington-based group Environmental Defense acknowledged at a news conference Wednesday. However, uncertainties linger over **the possible harm of** nanomaterials and **nanoparticles on** human health and **the environment**, they cautioned**. For example,**

nanoparticles used as anti-tumor agents are so small that they might slip inside the human **brain and** perhaps **damage it. Likewise, if leaked from a factory, the particles might destroy river bacteria, which lie at the base of much of the food chain.** Because the toxic aspects of nanotechnology remain a frontier subject of research, "our traditional ways of thinking about hazardous materials are going to have to broaden a bit," said Dr. John Balbus, the organization's health program director. He and three colleagues wrote an article about the potential downsides of nanotechnology for a recent issue of the journal Issues in Science and Technology, a joint publication of the U.S. National Academy of Sciences and the University of Texas.

Coral reefs are resilient – interconnectivity → recovery

McClanahan et al. 2

(Tim McClanahan (Wildlife Conservation Society), Nicholas Polunin (Newcastle University), and Terry Done (Australian Institute of Marine Science), "Ecological States and the Resilience of Coral Reefs," http://www.ecologyandsociety.org/vol6/iss2/art18/main.html VM)

Coral reefs can be resilient to multiple scales of disturbances (Pandolfi 1996, Connell 1997). One important factor that determines the degree of resilience at a particular place is the scattered patchy distribution of reefs throughout tropical ocean basins (IUCN/UNEP 1988). **Individual reefs may be replenished to a greater** or lesser extent **by recruitment from planktonic larvae derived from other reef sources outside of the disturbed areas** (Hughes et al. 1999a). **Ocean**-wide **currents** can potentially **deliver larvae across** hundreds and **thousands of kilometers** (Roberts 1997), although actual dispersal may be more limited (Cowen et al. 2000). Consequently, **the combination of spatial heterogeneity and refugia of reef systems, the** temporal **heterogeneity** of dispersal, **and a** physically **stable but moving transport system of currents ensures the connectivity among reefs that is required for recovery. This is an important aspect of ecological resilience.**